

TEST REPORT No: (5211)313-0692

TEST REPORT

To:	AMERICAN TECHNOLOGY COMPONENTS. INC.	To:	-
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Folder No.:	BVCX11NO094ETHS-B		

Factory name:	WENZHOU BAOXIANG ELECTRIC CO., LTD.
Location:	No.59 Nanxijiang Road Economic And Development Zone Wenzhou Zhejiang China
Product:	2 BUTTON Genesis RF SYSTEM MODEL: GS Jr.




Sample No:	HK111107/019
Test date:	November 15, 2011
Test Requested:	FCC Part 15 – 2010
Test Method:	ANSI C63.4 – 2009
FCC ID:	YGN-RF2BTN001

The results given in this report are related to the tested specimen of the described electrical apparatus.

CONCLUSION: The submitted sample was found to COMPLY with requirement of FCC Part 15 Subpart C.

Authorized Signature:

	
Reviewed by: Keith Yeung	Approved by: Steven Tsang
Date: November 25, 2011	Date: November 25, 2011



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Test Laboratory & Test Instruments List

Radiated and Conducted emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009. An Open Area Test Site and Full Anechoic Chamber (FCC Listed Site, Registration No. 642151) are set up for investigation and located at :

BUREAU VERITAS HONG KONG LIMITED, EMC CENTRE

No. 2106-2107, 21/F., Westin Centre,
26 Hung To Road,
Kwun Tong, Kowloon,
Hong Kong

Test Instrument List

Radiated Emission

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION DUE
EMI TEST RECEIVER	R&S	ESCI	100379	13-DEC-2011
BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	16-SEP-2012
OPEN AREA TEST SITE	BVCPS	N/A	N/A	07-JUL-2012
SPECTRUM ANALYZER	ADVANTEST	R3127	111000909	24-JAN-2012
HORN ANTENNA	SCHWARZBECK	BBHA9120D	9120D-692	16-SEP-2012
PREAMPLIFIER	SCHWARZBECK	BBV9718	9718-152	16-SEP-2012
ANECHOIC CHAMBER	ALBATROSS	M-CDC	80374004499B	25-OCT-2012
COAXIAL CABLE	HUBER+SUHNER	RG214	N/A	06-OCT-2012

Remarks:-

N/A : Not Applicable or Not Available

The measurement instrumentation uncertainty would be taking into consideration on each of the test result

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Equipment Under Test [EUT]

Description of Sample:

Model Name: 2 BUTTON Genesis RF SYSTEM

Model Number: GS Jr.

Rating: 6Vd.c. ("CR2032" size battery x 2)

Description of EUT Operation:

The Equipment Under Test (EUT) is a **AMERICAN TECHNOLOGY COMPONENTS. INC.** RF transmitter. It is a 3 buttons transmitter and operating at 433MHz. The EUT transmit while buttons is being pressed. Modulation by IC, and type is ASK modulation.

The transmitter has different control:

1. On/Off button – Power on/off control
2. Extend button – Transmission on (push-to-operate)
3. Retract button – Transmission on (push-to-operate)

Antenna Requirement (Section 15.203)

The EUT is use of a permanently antenna. It is soldered on the PCB. The antenna consists of 20mm long metal spring antenna. The antenna is not replaceable or user serviceable. The requirement of S15.203 are met. There are no deviations or exceptions to the specifications.

Photo of Antenna



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Radiated Emissions (Fundamental)

Test Requirement: FCC Part 15 Section 15.231(a)
Test Method: ANSI C63.4
Test Date(s): 2011-11-15
Temperature: 25.0 °C
Humidity: 66.0 %
Atmospheric Pressure: 100.9 kPa
Mode of Operation: Transmission mode
Tested Voltage: 6Vd.c. ("CR2032" size battery x 2)

Test Procedure:

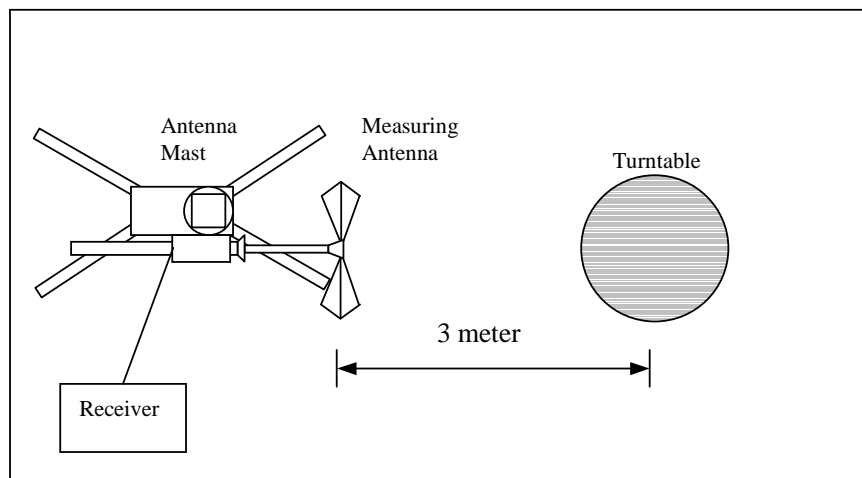
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using new battery. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.

Location: The Roof, Westin Centre, 26 Hung To Road, Kwun Tong, Kowloon, Hong Kong

Test Setup: Open Area Test Site





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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.231(a)]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [$\mu\text{V/m}$]	Field Strength of Spurious Emission [$\mu\text{V/m}$]
260-470	3,750 to 12,500**	375 to 1,250**

**linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 260-470MHz, $\mu\text{V/m}$ at 3 meters = $41.6667(F) - 7083.3333$. The maximum permitted unwanted emission level is 20dB below the maximum permitted fundamental level]

Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: Peak

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dB $\mu\text{V/m}$)	Limit at 3m (dB $\mu\text{V/m}$)	Margin (dB)
433.936	H	17.6	73.7	100.8	-27.1
433.936	V	17.6	72.5	100.8	-28.3

Detection mode: Average

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dB $\mu\text{V/m}$)	Limit at 3m (dB $\mu\text{V/m}$)	Margin (dB)
433.936	H	17.6	68.3	80.8	-12.5
433.936	V	17.6	67.1	80.8	-13.7

For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

**Duty Cycle Correction = $20\text{Log}(0.536) = -5.4\text{dB}$

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz
VBW = 300KHz



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Radiated Emissions (Spurious Emission)

Test Requirement: FCC Part 15 Section 15.231(a)
Test Method: ANSI C63.4
Test Date(s): 2011-11-15
Temperature: 25.0 °C
Humidity: 66.0 %
Atmospheric Pressure: 100.9 kPa
Mode of Operation: Transmission mode
Tested Voltage: 6Vd.c. ("CR2032" size battery x 2)

Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: Peak

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
867.872	H	22.8	40.3	80.8	-40.5
1301.808	H	-7.1	37.2	74.0	-36.8
1735.744	H	-6.3	38.2	80.8	-42.6
2169.680	H	-3.6	39.3	80.8	-41.5
2603.616	H	-3.4	38.3	80.8	-42.5
3037.552	H	-2.2	42.8	80.8	-38.0
3471.488	H	-1.2	42.9	80.8	-37.9
3905.424	H	0.0	49.7	74.0	-24.3
4339.360	H	1.3	53.2	74.0	-20.8
4773.296	H	2.5	42.5	74.0	-31.5

Note: Field Strength includes Antenna Factor, Cable Loss and Preamplifier gain (0.5-18GHz)

Receiver setting (30-1000MHz) :RBW = 100KHz
:VBW = 300KHz

Receiver setting (1-18GHz) :RBW = 1MHz
:VBW = 1MHz



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Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: Peak

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
867.872	V	22.8	50.2	80.8	-30.6
1301.808	V	-7.1	38.3	74.0	-35.7
1735.744	V	-6.3	36.0	80.8	-44.8
2169.680	V	-3.6	44.3	80.8	-36.5
2603.616	V	-3.4	42.0	80.8	-38.8
3037.552	V	-2.2	41.5	80.8	-39.3
3471.488	V	-1.2	41.2	80.8	-39.6
3905.424	V	0.0	48.8	74.0	-25.2
4339.360	V	1.3	54.7	74.0	-19.3
4773.296	V	2.5	43.0	74.0	-31.0

Note: Field Strength includes Antenna Factor, Cable Loss and Preamplifier gain (0.5-18GHz)

Receiver setting (30-1000MHz) :RBW = 100KHz
:VBW = 300KHz

Receiver setting (1-18GHz) :RBW = 1MHz
:VBW = 1MHz

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Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: Average

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
867.872	H	22.8	34.9	60.8	-25.9
1301.808	H	-7.1	31.8	54.0	-22.2
1735.744	H	-6.3	32.8	60.8	-28.0
2169.680	H	-3.6	33.9	60.8	-26.9
2603.616	H	-3.4	32.9	60.8	-27.9
3037.552	H	-2.2	37.4	60.8	-23.4
3471.488	H	-1.2	37.5	60.8	-23.3
3905.424	H	0.0	44.3	54.0	-9.7
4339.360	H	1.3	47.8	54.0	-6.2
4773.296	H	2.5	37.1	54.0	-16.9

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
867.872	V	22.8	44.8	60.8	-16.0
1301.808	V	-7.1	32.9	54.0	-21.1
1735.744	V	-6.3	30.6	60.8	-30.2
2169.680	V	-3.6	38.9	60.8	-21.9
2603.616	V	-3.4	36.6	60.8	-24.2
3037.552	V	-2.2	36.1	60.8	-24.7
3471.488	V	-1.2	35.8	60.8	-25.0
3905.424	V	0.0	43.4	54.0	-10.6
4339.360	V	1.3	49.3	54.0	-4.7
4773.296	V	2.5	37.6	54.0	-16.4

Note: Field Strength includes Antenna Factor, Cable Loss and Preamplifier gain (0.5-18GHz)

Receiver setting (30-1000MHz) :RBW = 100KHz
:VBW = 300KHz
Receiver setting (1-18GHz) :RBW = 1MHz
:VBW = 1MHz



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Radiated Emissions

Test Requirement: FCC Part 15 Section 15.209
Test Method: ANSI C63.4
Test Date(s): 2011-11-15
Temperature: 25.0 °C
Humidity: 66.0 %
Atmospheric Pressure: 100.9 kPa
Mode of Operation: Transmission mode
Tested Voltage: 6Vd.c. ("RC2032" size battery x 2)

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
1.705-30	300
30-88	100
88-216	150
216-960	200
Above 960	500

Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: Quasi-Peak

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
150.66	H	10.9	20.3	43.5	-23.2
195.28	H	9.6	21.2	43.5	-22.3
220.26	H	10.3	22.3	46.0	-23.7
336.74	H	14.8	24.5	46.0	-21.5
478.30	H	18.5	28.2	46.0	-17.8
526.00	H	18.8	28.9	46.0	-17.1

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz
VBW = 120KHz



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Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: Quasi-Peak

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
150.66	V	10.9	20.9	43.5	-22.6
195.28	V	9.6	21.3	43.5	-22.2
220.26	V	10.3	22.0	46.0	-24.0
336.74	V	14.8	25.1	46.0	-20.9
478.30	V	18.5	27.3	46.0	-18.7
526.00	V	18.8	28.6	46.0	-17.4

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz
VBW = 120KHz



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20dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.231(a)(1)
Test Method: ANSI C63.4
Test Date: 2011-11-15
Temperature: 25.0 °C
Humidity: 66.0 %
Atmospheric Pressure: 100.9 kPa
Mode of Operation: Transmission mode
Tested Voltage: 6Vd.c. ("CR2032" size battery x 2)

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

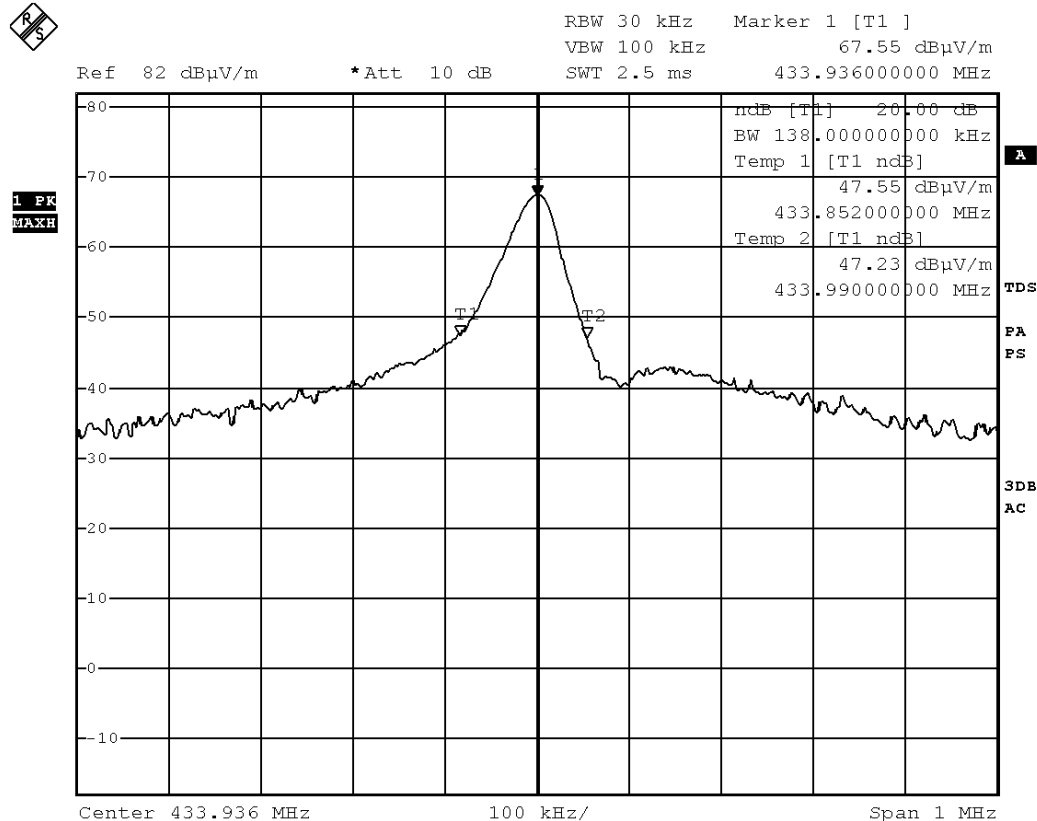
Limits for 20dB Bandwidth of Fundamental Emission:

Frequency [MHz]	20dB Bandwidth [kHz]	Limits [kHz]
433.936	138.0	1084.8

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Measurement Data :

Test Result of 20dB Bandwidth of Fundamental Emission: PASS



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Duration of Transmission

Test Requirement:	FCC 47 CFR 15.231(a)(1)
Test Method:	ANSI C63.4
Test Date:	2011-11-15
Temperature:	25.0 °C
Humidity:	66.0 %
Atmospheric Pressure:	100.9 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	6Vd.c. ("CR2032" size battery x 2)

Test requirement: 15.231(a)(1)

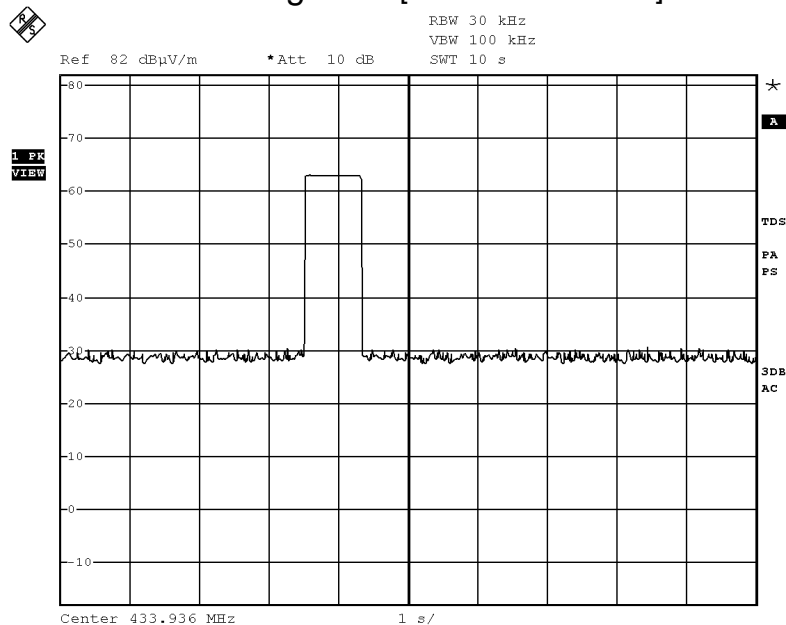
A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 second of being released.

Result: Pass

The transmitter is manually operated employing a push-to-operate switch and Figure A shows that it has been deactivated immediately of being released.

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Figure A [Each transmission]



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Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (100msec) never exceeds a series of 38 short (0.6msec) pulses, 2 medium (5.6msec) and 2 long (9.8msec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered $(38 \times 0.6) + (2 \times 5.6) + (2 \times 9.8)$ per 100msec = 53.6% duty cycle. Figure B through D show the characteristics of the pulse train for one of these functions.

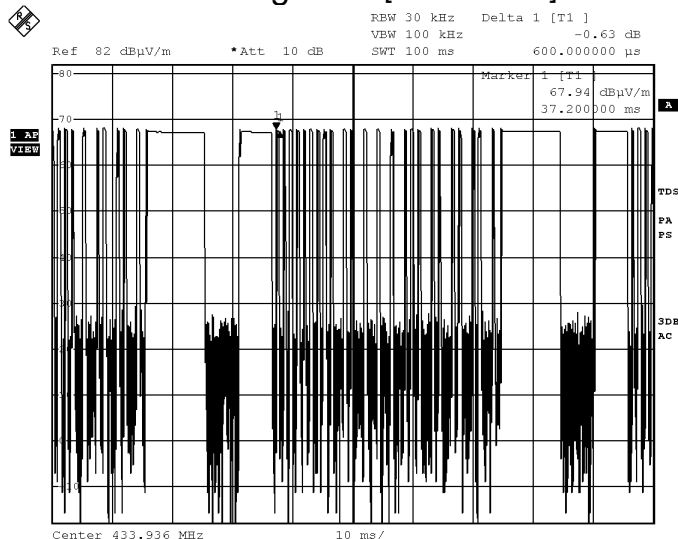
Remarks:

Duty Cycle Correction = $20\text{Log}(0.536) = -5.4\text{dB}$

The following figures [Figure B to Figure D] show the characteristics of the pulse train for one of these functions.

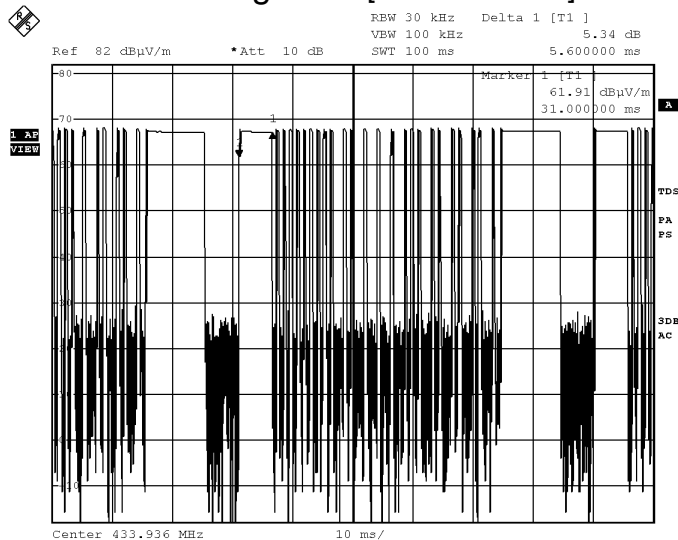
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Figure B [Short Pulse]



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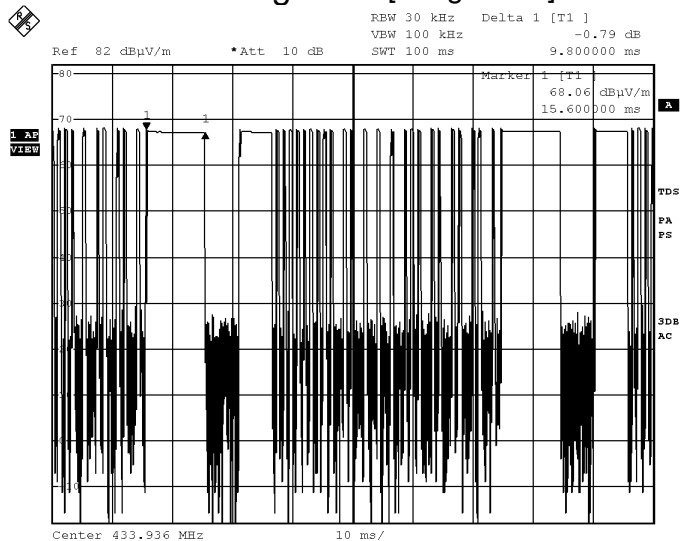
Figure C [Medium Pulse]



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Figure D [Long Pulse]



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Photographs of EUT

Front View of the product



Rear View of the product



Side View of the product



Side View of the product



Battery Compartment



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Front View of the product (Internal)



Rear View of the product (Internal)



Inner Circuit Front View



Inner Circuit Rear View



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Measurement of Radiated Emission Test Set Up



******* End of Report *******